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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/704,359	11/01/2000	Truong-Thao Nguyen	10991132-1	4751

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EXAMINER

LE, BRIAN Q

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/704,359

Applicant(s)

NGUYEN, TRUONG-THAO

Examiner

Brian Q Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17 is/are allowed.
- 6) ☒ Claim(s) 18-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment and Arguments

1. Applicant's amendment filed April 02, 2004, has been entered and made of record.
2. The rejection of claims 7, 8, 15, 20, and 22 under 35 U.S.C. 112, first paragraph is withdrawn.
3. Applicant's arguments, see page 9 of the Amendment, filed April 02, 2004, with respect to claims 1-17 have been fully considered and are persuasive. The rejection of claims 1-17 under 35 U.S.C. 102(b) has been withdrawn.
4. Applicant's arguments, see page 10 of the Amendment, filed April 02, 2004, with respect to the rejection(s) of claim(s) 18 under 35 U.S.C. 102 (b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Matsugu U.S. Patent No. 6,636,635.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Le U.S. Patent No. 6,608,942 and Matsugu U.S. Patent No. 6,636,635.

Regarding claim 18, Le teaches a method of detecting edges of features (abstract) in digital images comprising:

Computing a first luminance characteristic of a selected region of an input digital image, said first luminance characteristic being related to variations of luminance values within said

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selected region (the detection of pixel's brightness base on different intensity) (column 2, lines 19-23 and column 3, lines 20-45);

Extracting the maximum luminance value from said selected region of said input digital image (FIG. 17 C, element 1752 and column 27, lines 1-55); and

Comparing said first luminance characteristic and said maximum luminance value to corresponding thresholds to determine whether said selected region of said input digital image includes an edge of a text (column 27, lines 1-55).

Le does not explicitly disclose the concept of determining whether said maximum luminance value exceeds on of said corresponding thresholds. Matsugu teaches a method of processing image edges including the step of determining whether said maximum luminance value exceeds on said corresponding thresholds (column 32, lines 54-63). Modifying Le's method of detecting edge of images according to Matsugu would able to further normalize and optimize image processing (column 32, lines 65-67 and column 33, lines 1-15). This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Le according to Matsugu.

Regarding claim 19, Le teaches the method wherein said step of computing said first luminance characteristic includes computing a two-dimensional luminance gradient value for said selected region of said input digital image (it is well known for one skilled in the art that gradient is a two-dimensional vector of derivative values in each of the x and y direction) (Table 2 and column 10, lines 60-67).

Regarding claim 20, Le discloses the method wherein said step of computing said first luminance characteristic includes computing a two-dimensional luminance curvature

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(edge/boundary) value for said selected region of said input digital image (FIG. 10A and column 19, lines 13-18).

Regarding claim 21, please refer back to claim 18 for further explanation.

Regarding claim 22, Le also teaches the method wherein said step of computing said second luminance characteristic includes computing a two-dimensional luminance curvature (edge/boundary) value for said selected region of said input digital image (FIG. 10A and column 19, lines 13-18).

Regarding claim 23, please refer back to claim 18 for further explanation.

Allowable Subject Matter

7. Claims 1-17 are allowed.

REASONS FOR ALLOWANCE

8. The following is an examiner's statement of reasons for allowance:

The prior art of record does not show the limitations of a method detecting edges of features in digital image comprising computing a second luminance characteristic corresponding to curvature of said luminance values and the process of determining whether either first or second luminance characteristics exceeds a predefined threshold.

Cited Reference

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to edge detection, luminance, chrominance comparisons, and curvature analysis:

Mokhtarian et al., "Robust image corner detection through curvature scale space"; Pattern Analysis and Machine Intelligence, I.E.E.E. Volume 20, Pages 1376-1381; December 1998.

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Strickland, "Tumor detection in nonstationary backgrounds"; Medical Image, I.E.E.E. Volume 13, Pages 491-499; September 1994.

Verbeek et al., "On the locatin error of curved edges in Low-Pass Filtered 2-D and 3-D Images"; Pattern Analysis and Machine Intelligence, I.E.E.E. Volume 16, Pages 726-733; July 1994.

Wuescher et al., "Robust contour decomposition using a constant curvature criterion"; Pattern Analysis and Machine Intelligence, I.E.E.E. Volume 13, Pages 41-51; January 1991.

El-Fallah et al., "The evolution of mean curvature in image filtering"; Image Process, I.E.E.E. Volume 1, Pages 298-302; Nov. 1994.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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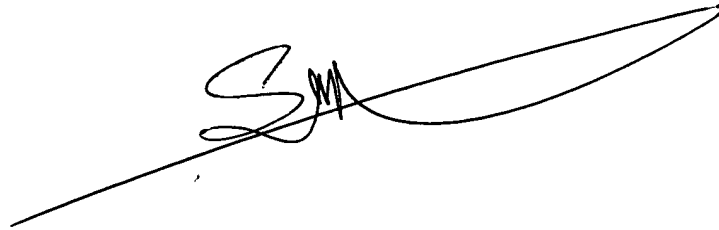
Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

BL
May 13, 2004

A handwritten signature in black ink, appearing to read 'SM', with a long, sweeping horizontal line extending to the left and a curved line extending to the right.

**SAMIR AHMED
PRIMARY EXAMINER**